Thermostatic Mixing Valves

• Thermostatic Mixing Valve Application & Installation
**WHY A THERMOSTATIC MIXING VALVE?**

The principle of automatic control of hot and cold fluids ensures you of efficient management of hot water: no water and energy are wasted through trial and error when adjusting the temperature; reduction of in-line heat losses; temporary interruption of the controlled temperature water flow as often as required.

- The thermostatic mixing valve assists in ensuring that the system components such as tap heads, seats and solenoid valves are less encrusted with scale, thus ensuring a longer service life of all the equipment and piping.

- It significantly increases the output capacity of the accumulator.

- The WATTS Industries interchangeable mixing valve mechanism also contributes to savings by enabling a mixing valve to be renewed for a lower cost.

- It is commonly accepted that a thermostatic mixing valve provides energy savings of 30% compared to a simple mixing valve. For private individuals, the equipment is soon amortized.

**PREVENT THERMAL SHOCK AND SCALDING INJURIES**

Hot water burns like fire. The tender skin of very young children and the slow reaction time of the elderly and the handicapped make them most vulnerable to serious hot water burns.

Scalding injuries are tremendously painful, and the effects can last for years.

Scalding occurs for a variety of reasons. In some cases, water heater thermostats are faulty, or set too high. In others, temperature regulating valves at the domestic hot water source are either malfunctioning or missing altogether.

Water heaters are normally set to temperatures above 55°C to prevent development of harmful bacteria, such as Legionella, in the water supply. Water at temperatures above 43°C are painful.

At a temperature of 55°C, a child can be scalded in less than 4 seconds. 80 per cent of thermal injuries to children happened at home.

According to the new European standard EN1717 (protection against pollution of potable water in water installations and general requirements of devices to prevent pollution by backflow), thermostatic mixing valves must be equipped with approved check valves.

**FUNCTION**

A thermostatic mixing valve mixes cold and hot water, generally with a temperatures differential of at least 7°C, in order to obtain mixed water at a stabilized temperature. Therefore, it must compensate for pressure variations (frequent or abrupt), and temperature variations (slower). A real thermostatic mixing valve regulates both on the hot and cold water inlet, and compensates for the pressure variations.

It operates through automatic management of the admission of the hot and cold water, depending on a set point displayed on the handle. This automatic control is carried out entirely by the internal thermostat.

The original, superior feature of the thermostatic valve over all the other principles is the mixing chamber, with automatic reaction and automatic preservation of temperature.

If the pressure varies, the temperature in the mixing chamber varies, and correction is carried out in less than 2 seconds (this is equally true if the flowrate or temperature varies).
2 TYPES OF TECHNOLOGY: WAX ELEMENT AND BIMETALLIC STRIP

PRODUCTS WITH WAX ELEMENT: MMV, TL117, T9107, T9715, MINIMIXING + inset mixing valves T8175, T8147

The technique of these models is that of automatic regulation via a cylindrical “slide valve”, activated by a wax capsule up to flowrates of approximately 40 l/min. It is quite standard and competitive, but quickly reaches its limits beyond 40 l/min. The hot and cold water inlets are located on other side of this “slide valve”. When the water is too cold as regards the set point (upon opening), a spring pushes the “slide valve” and closes the cold side and thus opens the hot side completely.

PRODUCTS WITH BIMETALLIC STRIP: ULTRAMIX TX91, TX92, TX93, TX94, TX95, TX96, OMDA, FNC, Flanged Mixing valves (DN65, DN80 and DN100) + inset mixing valves TX8256, TX8280, TX83, TX84, TX85, TX86, TX824056, TX824080, TX824456, TX824480

Trubert is the inventor of the Bimetallic strip concept. Trubert is one of the most well-known names in thermostatic control and is our original brand name for thermostatic items. The TRUBERT Eurotherm technique uses the principle of double control through indirect action of a bimetallic strip. This receives temperature information corresponding to the set point and will react instantaneously (+/- 1 sec.). The double control will take place as follows: the bimetallic strip acts on a pre-mixing valve with a very small flowrate, also called the distributor, this will regulate the flow of water in two slave valves with membranes, causing an amplification of the signal, but ensuring the same mixture proportion and thus the same temperature. The slightest variation in use conditions will be passed along to the same operating chain: first the distributor and then the large water passages.

This technology is the basis of the WATTS Eurotherm success, since it combines substantial regulation and scale-resistance qualities (a decisive element for safety).

Water mixing is obtained by two independent valves – one for hot water, one for cold water – which operate like two hydraulic relays. These two valves are controlled by a bimetallic strip that records output water temperature. Its position can also be adjusted by means of the mixing valve’s control knob. The water runs at exactly the desired temperature. If it goes off by just one degree, the bimetallic strip instantly adjusts water mixing.

This operational principle provides many advantages:

- No load from water pressure is exerted on the bimetallic strip. Due to the bimetallic strip's high sensitivity and nearly non-existent inertia, it is not subject to any load and the mixing valve reacts instantly.
- Nearly non-existent hysteresis and improved durability over time with the bimetallic strip.
- No friction from moving metal parts means excellent resistance to scale and remarkable longevity.
- Thanks to the relay operational principle, low and high flow rates receive the same adjustment quality (which is true of all solutions available on the market).
- Anti-scalding feature: The hot water shuts off automatically if there is not enough cold water.
**LEGIONELLA : FAQ (FREQUENTLY ASKED QUESTIONS)**

**What is legionnaires’ disease?**
Legionnaires’ disease is a bacterial disease which may cause pneumonia. The majority of cases are reported as single (isolated) cases but outbreaks can occur.

**Why is it called legionnaires’ disease?**
An outbreak of this disease in Philadelphia in 1976, among people attending a state convention of the American Legion and led to naming the disease after this group. Subsequently, the bacterium causing the illness was identified and named Legionella pneumophila.

**Is this a new disease?**
No. While the bacterium was only recently identified, cases have been confirmed as far back as 1947 and some probably occurred before then.

**How widespread is the disease?**
Cases have been reported from all industrialised countries. Around 200 cases are reported each year in England.

**Where are legionella organisms found?**
Legionellas are widely distributed in the environment. They have been found in ponds, hot and cold water systems, and water in air conditioning cooling systems.

**How is legionnaires’ disease spread?**
The disease is spread through the air from a water source. Person to person transmission does not occur. Breathing in aerosols from a contaminated water system is the most likely route of transmission.

**Who gets legionnaires’ disease?**
All ages can be affected but it mainly affects people over 50 years of age, and generally men more than women.

**What are the symptoms?**
The early symptoms of leggonnaire’s disease include a 'flu-like' illness with muscle aches, tiredness, headaches, dry cough and fever. Sometimes diarrhoea occurs and confusion may develop. These symptoms frequently lead on to pneumonia. Deaths occur in 10-15% of otherwise healthy individuals and may be higher in some groups of patients.

**How soon do symptoms occur?**
The incubation period ranges from 2 to 10 days but is usually 3 to 6 days. In rare cases some people may develop symptoms as late as three weeks after exposure.

**What is the treatment?**
Antibiotics are effective in treating the disease.

**How is it diagnosed?**
A rapid diagnosis can be made by testing an urine sample from the patient, once the relevant symptoms have occurred.

**KEY POINTS TO PREVENT LEGIONELLA**

All over Europe, the Legionella disease changes habits and National Regulations. Main contamination by Legionella is due to evaporative condensers and air conditioning systems (cooling towers), spa pool and spray humidifiers or air washers. Water systems may occasionally be contaminated by Legionella which enters cold water storage systems from the main supply.

Legionella will only grow in sanitary distribution network when there are increased temperature, appropriate nutrients and stagnation.

The sanitary network has to comply with the national regulations. Analysis of water samples for Legionella should be carried out regularly.

**The main keys points of the Regulation are**

- 2 methods for fighting against these bacteria: thermal shock or chemical shock
- increased hot temperature from the heater (use water heaters with minimal or no storage)
- all storage water heaters should have a drain valve located in an accessible position at the lowest point of the vessel (accumulated sludge can be drained easily)
- permanent chemical treatment must be avoided
- use of recirculation systems: circulating loops
- ensure that the target temperature is achieved throughout all levels of the loop
- mixing valves must be as close as possible to the point-of-use
- mixing valves must have integrated check-valves
- equipment must allow easy cleaning and disinfection operation
- if a single mixing valve serves a multiple showerheads, these showers must be flushed frequently
- circulating loop should be designed to return the mixed water to the storage not less than 50°C* (55°C for Belgium and UK – 60°C for The Netherlands)
- hot and cold water distribution pipes must be insulated sufficiently (never together)
- dismantle and clean hoses, tap, showerheads and mixing valves minimum once a year

* according to National Regulation
**APPLICATIONS**

For choosing the most appropriate products, please follow the applications and sub-application below:

Market mixing valves is segmented by **Applications and Environments**:

- **Point of use control**, for aesthetic environment (i.e. bathroom, hotels or shopping malls...)
- **Point of use control**, without aesthetic needed (i.e. product installed in a technical sheath, motorway services, public building, hospitals...)
- **Group installation**, small multiple outlet (from 1 to 5 outlets)
- **Group installation**, large multiple outlet (from 5 to 50 outlets) or high flow application

**POINT OF USE:**

**Point of Use – high end or aesthetic:**

- **TL117**

**PURPOSE**

Thermostatic mixing valve designed to supply sinks and wash-basins with tempered water not exceeding a set temperature (up to 5 basins depending on flow rate of tap connections).

Ideal for multi-facility applications: schools, restaurants, laboratories, companies... anywhere needing a supply of water at a temperature pre-set on site.

**DESCRIPTION**

- Weight 0.95 kg. Easy-to-replace modular adjustment mechanism.
- Brass body. Polypropylene protective cover secured by a hexagonal socket screw, making the adjustment section tamper-resistant.
- No setting scale: temperature pre-set by installer or operator.
- Fitted with 2 approved check valves (KIWA, DVGW, NF, BELGAQUA, WRC).
- Hot and cold water inlets: F 1/2”.
- 1 top-mounted tempered water outlet: F 1/2”.
- Baseplate drilled for wall mounting.
- Temperature cannot be adjusted by user.
- BSP threaded: code TL117
- NPT threaded: code TL117NPT

**SCALD PROTECTION**

Hot water supply cut totally and immediately if cold water supply is interrupted.

**PROTECTION AGAINST LEGIONELLA**

- Cartridge can be removed and replaced (for easier scale removal and disinfecting).
- Integral approved check-valves (withstanding temperatures above 90°C).
- Hot water flush: simply remove the protective cover and turn the cartridge to maximum hot position to allow hot water to circulate (kills bacteria above 60°C).
- **MINIMIXing** (97320 – 97321 – 97322 – 97323)

**PURPOSE**
Specific thermostatic mixing valve for point of use control.
Designed to supply sinks, hand wash-basins or electronic faucets with immediate tempered water not exceeding a temperature set.
MINIMIXing provides high security level against scalding and Legionella bacteria.
**Ideal for multi-facility applications**: hospitals, nursing homes, hotels, schools, restaurants, laboratories, motorway services … anywhere needing an excellent temperature management, particularly on start up of flow.

**FEATURES AND BENEFITS**
- extra compact size,
- aesthetic design with brass body chrome polished,
- easily installed directly on isolating tap under basin or fixed on the wall with a plate provided in the box,
- temperature set secured by hexagonal socket screw (Allen key),
- easy to replace modular adjustment mechanism (cartridge),
- reducing maintenance service cost,
- no setting scale : temperature can be set only by installer or operator, not by user,
- fitted with 2 approved check valves (KIWA, WRC, DVGW, BELGAQUA, NF…),
- outstanding reliability,
- compliance with standard EN1111.

**SCALD PROTECTION**
High level of protection from scalding : failsafe in case of hot or cold water failure.

**PROTECTION AGAINST LEGIONELLA**
- Cartridge can be removed and replaced (for easier scale removal and disinfecting).
- Integral approved check-valves avoid connection risk between cold and hot water (withstanding temperatures above 90°C).
- Thermal shock : simply remove the protective cover and set the temperature with the Allen key to maximum hot position to allow hot water to circulate (kills bacteria above 60°C).
- The valve is delivered with a rinsing cover kit : after removing the cartridge and replacing with the rinsing cover kit, you can flush the valves with a disinfectant solution or with a water temperature up to 90°C without danger of damaging the thermostatic mechanism.

<table>
<thead>
<tr>
<th>Ø</th>
<th>connection hot water</th>
<th>connection cold water</th>
<th>connection mixed water</th>
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<tr>
<td>3/8&quot;</td>
<td>Female free nut</td>
<td>Male flat sealing</td>
<td>Male flat sealing</td>
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<tr>
<td>1/2&quot;</td>
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<td>Male flat sealing</td>
<td>Male flat sealing</td>
<td>97321</td>
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<tr>
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<td>compression fitting 12 mm</td>
<td>compression fitting 12 mm</td>
<td>97322</td>
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<tr>
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<td>Cartridge of replacement</td>
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<td>TCP6</td>
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</table>
**Thermostatic Mixing Valves**

**Point of Use – low end or hidden :**

- **MMV** body 1” with compression fitting 22 mm (97083)
- **MMV** body 1” with compression fitting 22 mm and 15 mm adapter (97084)

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**PURPOSE**

Thermostatic mixing valve designed to supply general purpose applications with tempered water not exceeding a set temperature.

Ideal for multi-facility applications:

Domestic homes, schools, restaurants, laboratories, motorway services, commercial buildings… anywhere needing a supply of water at a temperature pre-set on site.

**SCALD PROTECTION**

Rapid failsafe if cold water supply is interrupted (comply with EN1111 and with BS1415 Pt 2 - TMV2)

**FEATURES**

- Easily installed thermostatic mixing valve.
- Locking cap preventing the end user from adjusting the temperature.
- Outstanding reliability.
- DZR Brass body.
- Compliance with standard EN1111 and BS1415 Pt 2 (TMV2).
- Fitted with 2 approved check valves (KIWA, DVGW, NF, BELGAQUA, WRC).
- Can be installed in any position.
- Nickel plated finish.

**SPECIFICATIONS**

- 1/2” or 3/4” Male/Male union threaded on inlets and outlets or compression fitting 15 or 22 mm.
- Pressure at the valve inlets must be within the 10-1 ratio under flow conditions.
  The size and layout of pipework and in-line fittings must take this into consideration.
  Optimum performance achieved with equal pressure.
- Temperature : accurate to within two degrees of chosen temperature (with balanced dynamic pressure).
- Maximum static pressure : 10 bar.
- Operating pressure : 0,2 to 5 bar.
- Hot temperature supply : 52° - 75°C, *differential minimum hot/mix temperature must be 10°C.
- Cold temperature supply : 5 - 20°C.
- Temperature setting range : 30 to 65°C.
- Flow rate at 3 bar : 57 l/min.
- Flow mini : 5 l/min.
- Body strength : 25 bar.

<table>
<thead>
<tr>
<th>diameter</th>
<th>flow rate</th>
<th>adjustment range</th>
<th>type</th>
<th>code ref.</th>
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<tbody>
<tr>
<td>Male union threaded M/M/M 1/2” integrated check valves</td>
<td>33 L/min to 1 bar 57 L/min to 3 bar</td>
<td>30° to 65°C</td>
<td>MMV 1/2”</td>
<td>97082</td>
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<tr>
<td>Male union threaded M/M/M 3/4” integrated check valves</td>
<td>33 L/min to 1 bar 57 L/min to 3 bar</td>
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<td>97081</td>
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<td>30° to 65°C</td>
<td>MMV 22</td>
<td>97083</td>
</tr>
<tr>
<td>Compression fitting 22 mm + 15 adapter integrated check valves</td>
<td>33 L/min to 1 bar 57 L/min to 3 bar</td>
<td>30° to 65°C</td>
<td>MMV 15</td>
<td>97084</td>
</tr>
</tbody>
</table>
Boiler control (hot water storage boiler):

- MMV body 1" with compression fitting 22 mm (97083)
- MMV body 1" with compression fitting 22 mm and 15 mm adapter (97084)

Product description: please refer to page 7

Product Range

<table>
<thead>
<tr>
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<td>MMV 1/2”</td>
<td>97082</td>
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<td>Male union threaded M/M/M 3/4” integrated check valves</td>
<td>33 L/min to 1 bar, 57 L/min to 3 bar</td>
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- MMV – TMV3

Dedicated to the United Kingdom market, WATTS INDUSTRIES has developed a specific range of thermostatic mixing valves approved by the WRAS under the TMV3 scheme to the DO8 specification for basin, shower and bidet.

PRODUCT RANGE

MMV- TMV3 are available in a vast selection of connections.

SCALD PROTECTION

Rapid failsafe if cold water supply is interrupted (comply with EN1111 and with NHS DO8 TMV3).

FEATURES

- Easily installed thermostatic mixing valve.
- Locking cap preventing the end user from adjusting the temperature.
- Outstanding reliability.
- DZR Brass body.
- WRAS approved.
- TMV3 approved for the following designations: HP-B (High Pressure Bidet), HP-S (High Pressure Shower), HP-W (High Pressure Washbasin), HP-T44 (High Pressure bath with fill temperature up to 44°C), HP-T46 (High Pressure bath with fill temperature up to 46°C), LP-B (Low Pressure Bidet), LP-S (Low Pressure Shower), LP-W (Low Pressure Washbasin).
- Compliance with standard EN1111.
- Fitted with 2 approved check valves (BELGAQUA, DVGW, KIWA, NF, WRC).
- Can be installed in any position.
- Nickel plated finish.
GROUP INSTALLATION:

Group installation, 1 to 5 outlets, flow up to 42 l/min:
- T9715 – 1/2" B (white body) or C (chromed)
- T9107 – 3/4" B (white body) or C (chromed)

FEATURES

- **Comfort**: the water temperature obtained is accurate to within one degree. Individually checked in the factory, Trubert mixing valves must be calibrated before first use. An exclusive knob mounting system makes this calibration easy. Temperature regulation and stability are excellent, regardless of variations in pressure (max. 1.5 bar), mixing valve inlet temperature and flow rate.

- **Extremely straightforward to install**: no special tools are required; the hot water inlet is fitted on the left, with the mixed water outlet in vertical position. Trubert mixing valves can be placed in various positions without making the temperature difficult to read...

- **Scald protection**: the hot water is rapidly cut if the cold water supply is interrupted.

- **Very easy maintenance**: the durability and scale resistance of Trubert mixing valves ensure that maintenance is virtually nil. The cartridge can be easily replaced without dismantling the mixing valve.

PURPOSE

Recommended for all applications where the mixed water temperature must be kept exact and constant, and adjusted at any time.

Bathroom applications with low flow rate: showers, basins...
Electronic tap - Industrial uses - Chilled water applications

OPTIONS

Designed to adapt to all specific demands for water at a precise temperature, even at very low flow rate.

Several setting ranges: 15/50°C or 40/80°C or 0/40°C

PROTECTION AGAINST LEGIONELLA

- Cartridge can be removed and replaced (for easier scale removal and disinfecting).
- Integral approved check-valves (withstanding temperatures above 90°C).
- Various thermal flash possibilities: use in the 40/80°C range or remove the temperature knob and turn the cartridge to the maximum hot position allowing the water to flow at a hot temperature.

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Thermostatic mixing valves with a double regulation. Water mixing is obtained by two independent valves – one for hot water, one for cold water – which operate like two hydraulic relays. These two valves are controlled by a bimetallic strip that records output water temperature.

The water runs at the exact desired temperature.

This operational principle provides many advantages, (please refer to page 2) and especially:
- No friction from moving metal parts means excellent resistance to scale and remarkable longevity.
- Thanks to the relay operational principle, low and high flow rates receive the same adjustment quality (which is not true of all solutions available on the market).
- Rapid shut-off of mixed water supply if either the hot or cold supply fails.

FEATURES AND BENEFITS:
Device with integrated check-valves (full approved) and strainers. Recommended for all applications where the mixed water temperature must be kept exact and constant, and adjusted at any time. Standard temperature range: 10° to 50°C - Available by request for no extra charge: 0° to 40°C, 30° to 70°C or 50° to 90°C.

SPECIFICATIONS:
Knob with built-in locking - front protective cover (grey PVC). - Blue calibrated knob. Flow rates under 3 dynamic bar. 1 upper output.
Thermostatic mechanism: A guarantee of safety and proven reliability for over forty years, the ULTRAMIX thermostatic mixing valve mechanism is the same as that used in the former range. It is directly integral with the mixing valve cover.
Approved check-valves: Superior level hydraulic features, due to the valve closure member’s overall design.
Filtering: Filter anchored on watertight elastomer support. Perfect accessibility, disassembly without tools, easy cleaning requiring no special qualification.

PROTECTION AGAINST LEGIONELLA:
There are only 2 methods recommended to fight the Legionella bacteria:
1. raise the temperature up to 70°C (thermal shock)
2. disinfect (chemical shock)

The ULTRAMIX range makes it possible to fight legionella bacteria because it is completely compatible with these 2 methods:
With the mixing valve as is, you can:
- adjust temperature up to 70°C in circuit (by using a cartridge with temperature range 30 to 70°C on request).
- And/or by placing the cartridge in the "RINSE" position (turned over and fastened upside down - see simple standard operating procedure supplied in box), you can also:
- rinse the mixing valve and piping (important operation before activation).
- inject a disinfectant (chlorine) into the water supply system without danger of damaging the thermostatic mechanism, as it is no longer in contact with the water.
- carry out thermal shock at over 70°C, without danger of damaging the thermostatic mechanism as it is no longer in contact with the water.

<table>
<thead>
<tr>
<th>flow rate (L/min)</th>
<th>diameter</th>
<th>no of points*</th>
<th>finish</th>
<th>code ref.</th>
<th>weight</th>
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</thead>
<tbody>
<tr>
<td>mini 3 - maxi 56</td>
<td>M 3/4&quot;</td>
<td>20x27</td>
<td>1 to 7</td>
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<td>TX91E 1.8 kg</td>
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<td>1 to 7</td>
<td>chrome</td>
<td>TX91C 1.8 kg</td>
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<td>1 to 10</td>
<td>grey epoxy</td>
<td>TX92E 1.8 kg</td>
</tr>
<tr>
<td>mini 3 - maxi 80</td>
<td>M 3/4&quot;</td>
<td>20x27</td>
<td>1 to 10</td>
<td>chrome</td>
<td>TX92C 1.8 kg</td>
</tr>
<tr>
<td>mini 3 - maxi 120</td>
<td>M 1&quot;</td>
<td>26x34</td>
<td>1 to 15</td>
<td>grey epoxy</td>
<td>TX93E 2.8 kg</td>
</tr>
<tr>
<td>mini 3 - maxi 120</td>
<td>M 1&quot;</td>
<td>26x34</td>
<td>1 to 15</td>
<td>chrome</td>
<td>TX93C 2.8 kg</td>
</tr>
<tr>
<td>mini 5 - maxi 175</td>
<td>M 1&quot;1/4</td>
<td>33x42</td>
<td>1 to 21</td>
<td>grey epoxy</td>
<td>TX94E 4.6 kg</td>
</tr>
<tr>
<td>mini 5 - maxi 175</td>
<td>M 1&quot;1/4</td>
<td>33x42</td>
<td>1 to 21</td>
<td>chrome</td>
<td>TX94C 4.6 kg</td>
</tr>
<tr>
<td>mini 5 - maxi 260</td>
<td>M 1&quot;1/2</td>
<td>40x49</td>
<td>1 to 32</td>
<td>grey epoxy</td>
<td>TX95E 7.8 kg</td>
</tr>
<tr>
<td>mini 5 - maxi 260</td>
<td>M 1&quot;1/2</td>
<td>40x49</td>
<td>1 to 32</td>
<td>chrome</td>
<td>TX95C 7.8 kg</td>
</tr>
<tr>
<td>mini 6 - maxi 400</td>
<td>M 2&quot;</td>
<td>50x60</td>
<td>1 to 50</td>
<td>grey epoxy</td>
<td>TX96E 10.0 kg</td>
</tr>
<tr>
<td>mini 6 - maxi 400</td>
<td>M 2&quot;</td>
<td>50x60</td>
<td>1 to 50</td>
<td>chrome</td>
<td>TX96C 10.0 kg</td>
</tr>
</tbody>
</table>

* For information only. Take the coefficient of combined flow into consideration.
- ULTRAMIX High Protection mixing valve - Vandalism and tamper-proof.

Mixing valves designed specifically for Institutions applications.

The body and the metallic wall plate are chromed finished.

Standard temperature range : 10° to 50°C.
Available by request for no extra charge : 30° to 70°C.

<table>
<thead>
<tr>
<th>flow rate (L/min)</th>
<th>diameter</th>
<th>n° of points*</th>
<th>standard graduation 10°/50°</th>
<th>code ref.</th>
<th>weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>mini 3 - maxi 56</td>
<td>M 3/4&quot;</td>
<td>20x27</td>
<td>1 to 7 locking high protection</td>
<td>T/X91CHP</td>
<td>2,6 kg</td>
</tr>
<tr>
<td>mini 3 - maxi 80</td>
<td>M 3/4&quot;</td>
<td>20x27</td>
<td>1 to 10 locking high protection</td>
<td>T/X92CHP</td>
<td>2,6 kg</td>
</tr>
<tr>
<td>mini 3 - maxi 120</td>
<td>M 1&quot;</td>
<td>26x34</td>
<td>1 to 15 locking high protection</td>
<td>T/X93CHP</td>
<td>3,7 kg</td>
</tr>
<tr>
<td>mini 5 - maxi 175</td>
<td>M 1 1/4&quot;</td>
<td>33x42</td>
<td>1 to 21 locking high protection</td>
<td>T/X94CHP</td>
<td>5,3 kg</td>
</tr>
<tr>
<td>mini 5 - maxi 260</td>
<td>M 1 1/2&quot;</td>
<td>40x49</td>
<td>1 to 32 locking high protection</td>
<td>T/X95CHP</td>
<td>8,7 kg</td>
</tr>
<tr>
<td>mini 6 - maxi 400</td>
<td>M 2&quot;</td>
<td>50x60</td>
<td>1 to 50 locking high protection</td>
<td>T/X96CHP</td>
<td>10,8 kg</td>
</tr>
</tbody>
</table>

* For information only. Take the coefficient of combined flow into consideration.

Group installation high flow, or industrial application, flow up to 1200 l/min :

- High flow flanged mixing valves DN65, DN80, DN100, (by request : temperature range 30 to 70°C).

A range of thermostatic mixing valves specifically designed for high flow installations where hot temperature control is provided to multiple outlets (up to 1200 l/min). Suited for Sanitary or Industrial applications.

<table>
<thead>
<tr>
<th>type</th>
<th>DN</th>
<th>flow rate (L/min)</th>
<th>n° of points*</th>
<th>standard graduation 10°/50°</th>
<th>code ref.</th>
<th>weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>2 1/2&quot;, 65 mm</td>
<td>10 to 360</td>
<td>1 to 36</td>
<td>flanged mixing valve</td>
<td>T70065</td>
<td>36 kg</td>
</tr>
<tr>
<td>H</td>
<td>3&quot;, 80 mm</td>
<td>12 to 700</td>
<td>1 to 70</td>
<td>flanged mixing valve</td>
<td>T70080</td>
<td>49 kg</td>
</tr>
<tr>
<td>J</td>
<td>4&quot;, 100 mm</td>
<td>14 to 1200</td>
<td>2 to 120</td>
<td>flanged mixing valve</td>
<td>T70100</td>
<td>69 kg</td>
</tr>
</tbody>
</table>

* For information only. Take the coefficient of combined flow into consideration.

**Points requiring special attention**

The precision, sensitivity and long service life of the mixing valve will be ensured only insofar as it is properly maintained and if it is correctly chosen beforehand.

In order to define the size of the mixing valve which is best adapted to a given installation, it is absolutely necessary to know two elements : the total instantaneous flow rate, and the dynamic pressure available to the flow for the hot and cold water, at the mixing valve’s inlets.

It can be measured or calculated, by using the DARIES Chart or the WATTS software package, which is designed to validate the calculation carried out manually in order to choose the right mixing valve (according to pressures, pipe diameters, desired flow rate and number of points of use).

In no case should you permit static pressure greater than 10 bars.

- The proper dimensioning of the mixing valve, that is, the choice of flow rate (according to the data in our technical leaflets).
- The hot water temperature which must not exceed 85°C in order to avoid premature aging of the equipment and the installation, but must remain higher than the set point with a difference of 5°C between the two fluids.
- The meter for the main water supply, whose given maximum flow rate determines the installation’s possible flow rate.
- The length and diameter of the piping which, through pressure losses and water speed, will facilitate or complicate the installation’s operation.

**Connections :**

All our mixers for Group Installations (T9107, T9715, ULTRAMIX and Flanged models) are designed to take in HOT water on the LEFT-hand side and COLD water on the RIGHT-hand side.

On special request, when this arrangement is impossible, mixers can be fitted out in the opposite manner with a specific cartridge type "IN".
**The problem**

Legionella, responsible for legionnaire's disease, is a bacterium naturally present in water and is found in water pipes. Its spread represents a very serious danger for public health.

Contamination occurs by inhaling contaminated air.

The most frequent reasons for a dangerous spread of the bacterium are:
- hot water temperature too low,
- stagnation of this water in the systems,
- sedimentation and scaling in pipes.

Destroying the bacteria requires raising the temperature at 60°C - 140°F (Legionella will die in +/- 30 minutes).

On the other hand, the increased temperature of hot sanitary water systems multiplies the risks of serious scalding of users at a point of use.

**The analysis and know-how of WATTS INDUSTRIES**

The worldwide expertise and know-how of WATTS Industries leads to better prevention with a complete solution for temperature control in hot sanitary water systems: from the ULTRAMIX constant temperature mixed water loop through to MINIMIXing point of use protection, the "multi-level" approach guarantees the right water temperature for each type of use.

This involves controlling water temperature in facilities from production and distribution through to the point of use.

Hot water production should provide water at a constant 65°C, or even higher to carry out thermal disinfecting.

The principle of the loop is essential. The first distribution loop, for washbasins and kitchens, is kept constant with a return to production at 50/55°C minimum.

With ULTRAMIX, the thermostatic mixing valve for multi-point applications, the loop ensures that all points of the loop are supplied with water mixed to a temperature that is constant to within one degree, regardless of the flow rate, pressure and temperature variations of the installation.

When the temperature has been raised as a preventive or curative measure, the mixer allows the temperature in the loop to be re-established immediately so that operation can quickly resume.

A second "level" of the loop, intended for high-risk areas such as showers, is fitted with a mixer calibrated to 40°C. This shorter system, with a lower volume of water, avoids any risks due to stagnation.

The thermostatic mixer, in addition to providing protection against scalding, also reduces scaling on equipment and pipes, extending the operating life of the complete system and minimising a bacterium development factor.

The principle of automatic fluid control ensures good management of hot water: no wastage of water and heat through trial and error adjustment of the temperature, reduction of heat loss along the line, turning the warm water on and off as often as required.

In multi-point applications, it is essential to combine usefulness, robustness and ease of use with cost savings.

Distribution of hot sanitary water imposes obligations on operators who must reduce their control costs but also provide systems that are very reliable for users. Comfort and safety of users must also be guaranteed.

The "multi-level" approach is a perfect response to these specific requirements. The wide possibilities of use, easy maintenance and compatibility with sanitary requirements make it an ideal solution.

Both ULTRAMIX, and the new MINIMIXing mixing valve, are available with temperature ranges from 30 to 70°C, they are fitted with approved check valves withstanding temperatures higher than 90°C and the mechanisms can be easily removed for replacement or descaling and disinfecting.

They allow preventive and curative operations against legionnaire's disease to be carried out: thermal and/or chemical shocks essential for killing the bacterium. But their most important quality is their minimum flow rate guaranteeing perfect operation even with only one shower in use, this is not the case with all multi-point mixing valves, which often require a higher flow rate to operate correctly.

This safety aspect must not be overlooked: imagine the risks for the late-arriving child who is last in the shower after the match!
THE "MULTI-LEVELS" APPROACH
THE RIGHT TEMPERATURE FOR EACH APPLICATION

**Key points of the regulation:**
- Increased hot temperature from the heater (use water heaters with minimal or no storage)
- Use of recirculation systems: circulating loop and balancing valves
- Ensure that the target temperature is achieved throughout all levels of the loop
- Circulating loop should be designed to return the mixed water to the storage not less than 55°C.
- Mixing valves must be as close as possible to the point of use.
- Mixing valves must have integrated check-valves.
- Mixing valves must allow easy cleaning and disinfection operation.
- Dismantle and clean hoses, tap, showerheads and mixing valves minimum once a year.
- Hot and cold water distribution pipes must be insulated sufficiently (never together).
- Easy removal of the thermostatic cartridge for descaling and disinfecting without dismantling the mixing valve.
- Possibility of carrying out a chemical shock:
  - Prevention of Legionella
  - Temperature control of the hot sanitary water system (up to the point of use)
  - Removing the risks of scalding by excessively hot water.
- The MINIMIXing is a very compact, modern-design (polished, chromium-plated body) thermostatic mixing valve that is easily installed on a wall-mounted isolating valve or on the wall-mounted plate supplied. The protected temperature setting is preset by the installer and the mechanism is remarkably fast-acting. MINIMIXing complies with European standard EN 1111.
- MINIMIXing’s features for preventing the spread of legionella include:
  - Easy removal of the thermostatic cartridge for descaling and disinfecting without dismantling the mixing valve. This is an annual operation (subject to survey of water conditions).
  - 2 check valves and stainless steel filters to prevent any contact between hot and cold water (allowing the bacterium to move from one system to the other : from the hot water to the cold for example).
  - Possibility of carrying out a thermal shock:
    - By opening the cover of the MINIMIXing and turning the cartridge to the maximum hot position (killing the bacteria from 60°C).
    - This operation is carried out annually or after each period of inactivity (easily achieved on the MINIMIXing by means of its thermostatic cartridge allowing temperatures up to 70°C).
  - Possibility of carrying out a chemical shock:
    - Using the rinsing kit supplied, it is very easy to carry out a flush with a disinfecting solution.

**Table 1 Development of legionella according to water temperature**

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Condition</th>
<th>Bacteria Death/Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;20°C / 69°F</td>
<td>Lethargic state</td>
<td></td>
</tr>
<tr>
<td>20-46°C / 68-115°F</td>
<td>Growth</td>
<td>90% of bacteria will die in a period of 2 hours</td>
</tr>
<tr>
<td>50°C / 122°F</td>
<td>90% of bacteria will die in 2 minutes</td>
<td></td>
</tr>
<tr>
<td>60°C / 140°F</td>
<td></td>
<td>90% of bacteria will die in 2 minutes</td>
</tr>
<tr>
<td>80°C / 176°F</td>
<td></td>
<td>90% of bacteria will die in less of 1 minute</td>
</tr>
</tbody>
</table>

**Flow diagram for a “multi-levels” complete mixed water circuit**

- **VM**: micrometer valves to stabilize circuit temperature.
- **VM1 A**: Open between 70 and 90%.
- **VM1 B**: Open between 30 and 15%.
- **Remark**: If there is a connection point on the boiler (R) the return circuit should be connected here (A).
- **Recycling of the loop**: with a minimum of six times the mixed water’s volume per hour.
- **Delivery of the pump**: total manometric hight, minimum 4 meters = head loss of the loop.

**Product solutions**

At the Interclima 2004 trade show WATTS Industries presented MINIMIXing : a thermostatic mixing valve for point of uses.

MINIMIXing plays its role in the complete "multi-level" solution deploying the ULTRAMIX multi-point mixing valve, by providing safe point of uses at the first temperature level of the distribution loop (temperature above 55°C):
- Prevention of Legionella
- Temperature control of the hot sanitary water system (up to the point of use)
- Removing the risks of scalding by excessively hot water.

The MINIMIXing is a very compact, modern-design (polished, chromium-plated body) thermostatic mixing valve that is easily installed on a wall-mounted isolating valve or on the wall-mounted plate supplied. The protected temperature setting is preset by the installer and the mechanism is remarkably fast-acting. MINIMIXing complies with European standard EN 1111.

MINIMIXing’s features for preventing the spread of legionella include:
- Easy removal of the thermostatic cartridge for descaling and disinfecting without dismantling the mixing valve. This is an annual operation (subject to survey of water conditions).
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  - This operation is carried out annually or after each period of inactivity (easily achieved on the MINIMIXing by means of its thermostatic cartridge allowing temperatures up to 70°C).
- Possibility of carrying out a chemical shock:
  - Using the rinsing kit supplied, it is very easy to carry out a flush with a disinfecting solution.

"No-scald" guarantee with MINIMIXing:
MINIMIXing guarantees total safety: if the cold water is cut, the supply of hot water is swiftly cut as well. In addition, the reliability of the thermostatic cartridge is based on 40 years’ expertise, ensuring that the preset temperature will remain perfectly constant regardless of variations in water pressure.
OEM APPLICATIONS

WATTS eurotherm is the first European specialist in sanitary thermostatics since 1947. Hereafter some examples of our OEM customers.

Customers’ problems:  

- **Sanitary taps manufacturer**: integrating an efficient thermostatic mechanism, in compliance with the EN1111 standard, easy to assemble and to disassemble, at a competitive price.
- **Shower panel manufacturer**: providing a concealed thermostatic mixer, light and simple to industrialize, with a control shaft of a very short movement, which can receive all standard handles already used by the integrator.
- **Luxury tap manufacturer**: fitting out a complete range of luxurious sanitary taps with high precision thermostatic mixers, ready to be inset and allowing various combinations of outlets, with or without flow rate regulator.
- **Bath manufacturer for balneotherapy**: integrating a thermostatic mixer with an excellent response time, compact enough to require a small space to be installed, resistant for to special water applications like sea water and thermal water.
- **Boilers manufacturer**: in order to follow the market evolution, fitting out the range of sanitary boilers with a very economic temperature regulation, but with very high flow rate, with or without anti-scald security.
- **Machines for food-industry manufacturer**: getting a constant and very precise water temperature quickly and easily with a mechanism including food quality class materials, easy to maintain.

Watts-eurotherm thermostatic answers:

- A standard thermostatic cartridge, made in polymer:
  - interchangeable and easy to dismantle, this cartridge has many advantages:
  - no risk of blockage due to scale
  - excellent response time
  - anti-scald security
  - competitive price
  - enables the production of taps which meet the requirements of the European EN 1111
  - low rate of 15 l/min since a pressure of 0.5 bar

- A monobloc body + cartridge assembly ready to operate:
  - designed for direct incorporation into shower booths and sanitary panels
  - supplied with graduated dial and security stop index (0 to 40°C or 32 to 104°F)
  - control shaft which can receive all standard handles already used by the integrator on others series
  - order axle can be locked longitudinally, providing a small and constant clearance between the graduated handle and the wall (low risks of dirtying)
  - high flow-rates allowing the feed of a main shower head and side shower outlets
  - comfort of a constant temperature to the degree and a no-burn safety

- A range of concealed thermostatic mixers providing various combinations and made-to-measure trimming:
  - extremely simplified installation, no particular tools are necessary
  - very important flow-rates (up to 400 l/min) allowing the use of cascades and other accessories
  - easy to maintain
  - optimal comfort for the final user with a very precise and easy reading of the temperature (over dimensioned handle)
  - safety: all risks of burning are avoided, if cold water supply stops, hot water is automatically cut off

- A range of thermostatic mixers compact and efficient which can be inset into all kinds of medical baths:
  - possibility of special appliances with thermal water and sea water
  - excellent regulation and stability of the temperature, under any conditions of pressure and flow rate
  - several temperature ranges available: from 0 up to 90°C max.

- A complete range of thermostatic mixing valve at a very competitive price:
  - important flow rate: more comfort for the final user
  - small dimensions allowing integration on the existing frame
  - lots of different fittings: male, female, union, compression, 1/2", 3/4", 1"
  - very easy to adapt to existing installations
  - non-return check valve integrated and locking device for the chosen temperature
  - compliance with several agreements (WRC, ASSE 1016...)

- A range of apparent thermostatic mixers with flow rates from 3 to 400 l/min:
  - almost no maintenance thanks to their longevity and scale resistance
  - interchangeable cartridges without dismantling or returning to the factory
  - easy reading of the temperature (over dimensioned handle)
  - wide choice of graduations in degrees: 0 to 40°C, 10 to 50°C, 30 to 70°C and 50 to 90°C
  - food quality class materials and metallic coating in accordance with the official requirements

The application:

- **Sanitary taps**
- **Shower panel**
- **Luxury tap**
- **Bath manufacturer for balneotherapy**
- **Boilers manufacturer**
- **Machines for food-industry manufacturer**
WHY A WATTS EUROTHERM MIXING VALVES?

The operating simplicity of WATTS mixing valves results from their ease of implementation and the unparalleled quality of the result.

➜ Outstanding customer Service: product widely distributed across Europe.

➜ Guarantee: mixing valve and cartridge guaranteed for 2 years.

➜ Manufacturer: WATTS EUROTHERM has ISO 9001 certification (2000 version) through the BVQI.

➜ Market background and know-how: present since 1947.

Mixing cold and hot water in order to obtain water which is mixed at a stabilized temperature within one degree: this is the important part.

A thermostatic mixing valve means substantially reduced water consumption, absolute safety – no water which is suddenly uncomfortably hot or cold – guaranteed regulation of flowrates, from the very lowest to the highest, piping and valves protected from limestone deposits, a larger reserve of mixed water at the desired temperature.

Easy to install, simple to maintain, attractively designed, WATTS EUROTHERM thermostatic mixing valves are the basic element for genuine comfort in all plumbing facilities.

WATTS INDUSTRIES: the most complete range in thermostatics

CALCULATION SOFTWARE

The WATTS Eurotherm software package is designed to validate the calculation carried out manually in order to choose the right mixing valve (according to pressures, pipe diameters, desired flowrate and number of points of use).

Calculation method:
1 – The software defines the Accumulated Flowrate of mixed water by multiplying the number of equipment items to be supplied by the usual unit flows.

2 – It calculates the Total Instantaneous Flowrate to be provided by the mixing valve. Depending on the type of worksite (3 types), it chooses the reduction coefficient of flows corresponding to the quantity of equipment items to be supplied. It multiplies this coefficient by the accumulated flowrate in order to obtain the instantaneous flowrate.

3 – Then the software chooses the thermostatic mixing valve which will ensure the regulation at this instantaneous flowrate under the dynamic pressure (b. = bars) available for its operation.

NB: These pages do not include all of our thermostatic mixing valves ranges. For full technical specification and product ranges, please contact WATTS Industries or visit our website www.wattseurotherm.fr
Product range Watts Industries

- System disconnectors
- Backflow protection devices
- Check valves
- Safety units
- Safety relief valves
- Pressure reducing valves
- Automatic control valves
- Butterfly valves
- Shut off valves
- Measuring gauges

- Temperature control
- Expansion vessels
- Process switches
- Fuel products
- Gas products
- Electronic controls
- Installation protection products
- Radiator valves
- System products
- Manifolds and fittings